The outer edge of the gland is stitched to the margin of the pectoralis in order to hold it securely in its normal position. For all buried sutures and ligatures catgut is the preferable material, as it is quickly absorbed and does not leave, like silk, a remnant behind to become a source of irritation and suspicion.

The outer wound is closed by silkworm-gut sutures. The somewhat puckered or dimpled appearance of the contour of the breast, which is at first noticeable, soon disappears as the buried sutures become absorbed, and the deeper portions of the wound adjust themselves to their new relations. The stitches can be removed within a week's time, and the patient can be promised that confinement to bed is to be of a few days' duration only. No drainage is used, and in all but 3 cases the wound has healed by first intention. In these the removal of a stitch or two for drainage was all that was necessary to produce prompt healing of the wound. In case of a large cyst, or one very near the nipple, being accidentally opened, I am in the habit of sponging the wound with a weak solution of corrosive sublimate.

It is astonishing to see how little change in the appearance of the breast is produced by the operation. The skin incision is invisible to the patient herself as she stands before the glass. At the end of two or three months careful palpation fails to reveal the site of the deep incision. It is only by reference to my notes that I am able to tell which portion of the gland has been removed. I have performed this operation for cysts of the breast in all fifty times, and have never failed to be able to make a diagnosis at the time of operation, and have never had any reports of a recurrence of cystic or other disease in the patients operated upon.

Surely an operation which is comparatively a light ordeal to the patient, which removes all doubt as to the nature of the tumor, and all probability of a secondary development of cancer, is one that should commend itself above all others. A greater familiarity upon the part of practising surgeons with the classification of tumors of this organ, and with the gross pathological appearances, would doubtless save many a breast from being amputated.

THE SURGICAL ASPECTS OF GASTRIC CARCINOMA.[1]

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Cancer of the stomach is a disease of frequent occurrence. From 25 to 40 per cent. of all cancers in the body are primary in the stomach. Statistics[2] show that in Baltimore there are over 200 deaths annually from cancer; in Boston there are over 300, in Philadelphia nearly 500, and in New York nearly 900 deaths every year from some form of cancer. Of these deaths more than a fourth, and perhaps almost a half, are directly due to cancer of the stomach. Dowd[3] says that the United States Census Report for 1900 recorded 9000 deaths from cancer during that year, that 31 per cent. of fatal cancers were in the stomach, that probably many cancers of the liver and the abdomen were primarily gastric, and that many cases of gastritis and allied diseases were really carcinomatous in nature.

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[1] Read at the meeting of the Southern Surgical and Gynecological Association, Baltimore, December 11, 12, and 13, 1906.

Medical measures are powerless to cure cancer in any region of the body. Escharotic pastes, cauterizing applications, detergent washes, serums and antitoxins, and even the subtile power of the x-rays and the Finsen light are all of them powerless to cure external cancer. How much more improbable it is that any save surgical remedies will cure cancer of the internal organs! That, in the case of inoperable tumors, medical measures will sometimes prolong life and mitigate suffering, no one would be so foolish as to deny. The wide experience of Jacobi,[4] so cautiously and conservatively expressed, in regard to the beneficial effects of methylene blue (methylthionin hydrochloride) in such patients, is a gratifying example of what may be done by medical science even for hopeless cases. But, as Bland Sutton[5] said a number of years ago, as long as we are ignorant of the cause of cancer, so long must the only successful treatment be the extirpation of the growth; and I may add that the sooner this is done the better for the welfare of the patient and for the reputation of the family physician and the surgeon.

If it were possible to prevent cancer, what then? Before answering this question one would have to determine the cause of cancer; and of its specific cause we are absolutely ignorant. That it is caused by some form of micro-organismal life it seems safe to infer; but beyond such an inference even the most enthusiastic pathologists will not go.[6] But we do know many of the predisposing causes of cancer, and especially well recognized are the predisposing causes of gastric cancer, which is all that concerns us now.

Mumford and Stone[7] traced 60 patients who had been treated at the Massachusetts General Hospital for chronic indigestion, and who subsequently died. Of these, no less than half died of gastric carcinoma. They further made a study of 50 patients with gastric carcinoma, and learned that in no less than 41 of the 50 patients there was "a history either of ulcer or of long-continued digestive disturbance, of which the exact nature could not be ascertained." Mayo[8] found a history of ulcer or other disease in 36 per cent. of his patients with cancer of the stomach, and clear evidence of cancer developed on ulcer in 30 per cent. of the last 40 pylorectomies and partial gastrectomies. Moynihan[9] noted a history of gastric ulcer or chronic indigestion in 27 out of 45 patients with cancer of the stomach (60 per cent.). Among 22 patients with gastric carcinoma, so far advanced as to be operable only by gastroenterostomy, no less than 16, or over 72 per cent., gave such a history. Jedlicka[10] quotes Ssapesko as stating that among 100 cases of gastric carcinoma only 10 were found in which the cancer was not engrafted on a preceding ulcer. Further statistics could no doubt be quoted; they would merely serve to emphasize the point that I am trying to make, *that chronic gastric dyspepsia is the chief predisposing cause of cancer of the stomach.*

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[2] Bryant, quoted by Van Valzah and Nisbet, Diseases of the Stomach, London, 1900, 513.

[3] N. Y. Med. Record, 1906, i, 91.

[4] Jour. Amer Med. Assoc., 1906, xlvii, 1545.

[5] Tumors, London, 1901, preface.

[6] See Gaylord, American Practice of Surgery, edited by Bryant and Buck, New York, 1906, i, 403.

[7] Surgical Aspects of Digestive Disorders, New York, 1905, pp. 87 and 201.

We know that cancer of the stomach presents clinically two forms. In one, a patient past middle life, without having suffered previously from indigestion, suddenly loses appetite especially for meats, grows progressively weaker and more emaciated, develops epigastric pain and possibly a palpable mass, becomes subject to vomiting spells every few days, which bring up a mass of coffee-ground material, foul smelling and fermented, and quickly develops the cancerous cachexia. This is the classical picture of gastric carcinoma, and it is still seen; but it is of rarity when compared with that other course of development which we have only begun to appreciate in the last few years. This second and much larger course is found in patients who have been life-long sufferers from dyspepsia. Medical treatment has at times given relief, but the indigestion recurs again and again. Appetite may be preserved, but digestion is torture; so abstemiousness becomes second nature. There may or there may not have been some period when gastric ulcer was suspected or actually diagnosticated. Usually there have been no very definite symptoms, and the patient has been treated for chronic gastritis. Finally these patients die, worn out with suffering, with prolonged starvation, and wearied with ineffectual drugging. At the autopsy a wide-spreading epitheliomatous ulcer is found, distorting the stomach, stenosing the pylorus, and binding the colon, the pancreas, the stomach, and perhaps the liver and the gall-bladder together in an indistinguishable mass of adhesions. The wonder is that such patients live so long.

Experience in the surgery of the upper abdomen within the last few years has taught surgeons much, but they have learned nothing of more importance than the security and certainty with which mechanical defects in the physiological action of the stomach may be remedied by mechanical means. If chronic and rebellious cases of indigestion were promptly turned over to the surgeon, and if suitable operations were done on such patients, there would be fewer cases of carcinoma of the stomach observed by physicians. Every case diagnosticated certainly as carcinoma of the stomach before operation is a disgrace to the attending physician, provided he has had the patient under treatment for more than a few weeks. Patients who present symptoms of gastric indigestion which will not yield in that time to medical treatment should be subjected to operation; and if operation is not undertaken, and the patient's disease is allowed to continue uncured until a diagnosis of cancer has been made, the disgrace and the responsibility rest on the attending physician. We know beyond peradventure that such patients as these can be cured by operation, and that the development of carcinoma may be thus prevented. For physicians not to recognize this fact and act accordingly is not only unjustifiable, it is criminal.

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[8] Jour. Amer. Med. Assoc.; 1905, ii, 1211.

[9] Trans. Clin. Soc. Lond., 1906, xxxix, 84.

[10] Operat. Behandl. d. Chron. Magengeschwürs, Prag., 1904, 24.

The point is now reached where it will, I think, prove beneficial to compare the results of operations on the stomach for benign disease with those for carcinoma of this organ. It is of interest first to know the immediate operative mortality, and then the proportion of ultimate recoveries or cures. In considering questions such as these it is injudicious to collect isolated operations reported at random by different surgeons. Statistics of abdominal operations which are so frequently done as are nowadays operations on the stomach present, when thus collected, a picture which is too likely to be distorted one way or the other: we obtain results which are neither phenomenally good nor phenomenally bad, but at any rate results which are far from the truth. In the earlier history of an operation such figures are of value, because the cases are few, and progress can only come when a sufficient number of observations has been collected for surgeons to study the principles which underlie the operation in question. Thus twenty years ago it was important to record every individual case of gastroenterostomy or pylorectomy, because no individual surgeon had at that time had the opportunity personally of observing the effects of more than one or two such operations. But now, when the experience of one surgeon may embrace a hundred or more such cases, the deductions to be drawn from such a series far outweigh in value those which were available even one decade ago from a series of similar size collected from various sources.

Let us consider, then, first the figures of gastroenterostomy for benign disease, an operation which may, I think, justly be considered as preventive of cancer. We have reports of large series of cases of this operation at the hands of various surgeons:

GASTROENTEROSTOMY FOR BENIGN DISEASE.

Operator.	Cases.	Mortality. Per cent.
Robson and Moynihan[11]	218	3.2
Mayo[12]	81	1.23
Czerny[13]	83	4.8
Mayo Robson[14]	97	1.03
Moynihan[15]	171	1.00
Deaver[16]	40	2.5
Morison[17]	27	3.7
Hartmann[18]	47	6.3

Now, it is a well-recognized fact that about 95 per cent. of patients who survive operation for benign disease remain well permanently. Consider these figures:

END RESULTS AFTER GASTROENTEROSTOMY FOR BENIGN DISEASES OF THE STOMACH.

Operator.	Cases traced.	Permanently cured.	
Barling	7	7	100.0 per cent.
Mayo	28	27	96.4 "
Moynihan	29	29	100.0 "
Czerny	53	44	83.0 "
Robson and Moynihan	20	20	100.0 "
Paterson (collective statistics)	116	109	93.9 "
Deaver	30	30	100.0 "
Robson	96	89	92.7 "

NOTE.—The latest statistics of Mayo in gastroenterostomy for benign disease give a mortality of practically 1 per cent.: actually 1.04 per cent.—2 deaths in 192 cases. My latest statistics show a mortality of less than 2 per cent.

May we not justly conclude that by timely resort to this operation many patients have been saved from the development of gastric carcinoma?

The cure of carcinoma of the stomach, when this dread disease has once developed, demands excision of the growth with the infected glands. The immediate operative mortality of partial gastrectomy is still very much higher than is that of the operation I have been considering, though the death rate has been reduced very much within the last few years.

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[11] Surg. Treat. Diseases of Stomach, New York, 1904, p. 177.
[12] Jour. Amer. Med. Assoc., 1905, ii, 1211.
[13] Petersen u. Machol, Beitr. z. klin. Chir., 1902, xxxiii, 297.
[14] Brit. Med. Jour., 1905, ii, 762.
[15] Lancet, 1905, ii, 362.
[16] Therapeutic Gazette, January 15, 1906.
[17] Brit. Med. Jour., 1905, ii, 777.
[18] Ibid., 772.

Partial Gastrectocy for Carcinoma.

Operator.	Cases.	Deaths.	Mortality. Per cent.
Mayo[19]	81 (25)	12 (1)	14.15 (4)
Kocher[20]	110 (58)	27 (9)	24.5 (15)
Mikulicz[21]	100	37	37.0
Mayd[22]	25	4	16.0
Krönlein[23]	50	14	28.0
Roux[24]	39	13	33.0
Meyer[25]	5	1	20.0
Kappeler[26]	30	8	26.6
Garré[27]	26	7	26.9
Hartmann[28]	22	7	31.8
Moynihan[29]	9	2	22.2
Paterson[30]	4	1	25.0

Note.—Mayo's latest statistics, as given in a personal communication, show a mortality of 11.45 per cent. for partial gastrectomy; while my latest statistics show a mortality of 11.11 per cent.

Taking, then, the more favorable recent figures of Mayo (4 per cent.) and of Kocher (15 per cent.), which offset to a certain extent the rather ancient statistics of Mikulicz, Krönlein, Roux, Hartmann, and others, we have a total of 393 partial gastrectomies with 104 deaths, or a mortality of 26.5 per cent., as the immediate result of operations for the radical cure of gastric carcinoma. This, it will be remembered, is to be contrasted with an immediate mortality of about 5 per cent. after operations for the prevention of this disease.

It will next be proper to determine what proportion of the 74 per cent. of patients who survive gastrectomy may reasonably hope to be ultimately and permanently cured of their disease. Let it not be forgotten that about 95 per cent. of patients surviving the prophylactic operation have been proved to be permanently cured. This question of the ultimate results of gastrectomy has been carefully studied by Moynihan,[31] who bases his conclusions largely on the statistics of Krönlein and Mikulicz, who alone of many operators have published in detail the terminal history of those patients whom they were able to trace. It is not the place here to discuss these statistics minutely, but it may be said that they show that patients suffering with gastric carcinoma have, under medical treatment, an expectation of life of about twelve months from the beginning of the disease. Many writers put it at less. Not only is this the duration of life, but it should not be forgotten that at the end of that time the patients under medical treatment will *all be dead.*

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[19] N. Y. State Jour. of Med., 1906, vi, 63.

[20] Paterson's Gastric Surgery, New York, 1906, p. 104.

[21] Paterson, loc. cit., p. 104.

[22] Paterson, loc. cit.

[23] Paterson, loc. cit.

[24] Paterson, loc. cit.

[25] N. Y. State Jour. of Med., 1906, vi, 68.

[26] Paterson, loc. cit.

[27] Paterson, loc. cit.

[28] Paterson, loc. cit.

[29] Trans. Clin. Soc. London, 1906, xxxix, 84.

[30] Gastric Surgery, New York, 1906, p. 178.

[31] Abdominal Operations, Philadelphia, 1905, p. 223.

There will not be even one who at the conclusion of that period will have had up to that time no recurrence of the growth, and who may, therefore, still be considered as curable—as potentially cured. If then surgery can show any permanent cures, and if the average duration of life under surgical treatment is longer, or at least not less than that under medical treatment, the conclusion is surely justified that surgical intervention is best for these patients.

To compare with an expectation of life of about twelve months for patients who have not been operated on, we know from Moynihan's studies that the average duration of life in patients who underwent gastrectomy in the clinics of Krönlein and Mikulicz was, from beginning to end of the disease, as much as twenty-four to twenty-six months—more than twice as long as the average duration of life without operation. Paterson's figures[32] from collective statistics give the duration of life after operation (86 operations in all) as an average of nineteen months after total gastrectomy (17 patients), of twenty-two and a half months after subtotal gastrectomy (14 patients), and of just over two years after partial gastrectomy (55 patients). It should be noted that Moynihan's figures refer to duration of life from the first symptoms of gastric cancer, while Paterson's refer only to the duration of life after operation. With this allowance, it is seen that the figures agree very closely; and as they are gathered from very different sources (Moynihan's from the German clinics and Paterson's largely from British sources), each series serves to confirm the other.

Not only, moreover, may the mere addition to the patient's life be of utmost importance from a social, commercial, or financial point of view, but death, when it does come, will attack the sufferer in a less hideous form. The patient will not die of starvation, as he would have done had no operation been performed. And although it would be heartless in the surgeon to tell his patient, when urging operation, that although the chance of permanent cure is slight, it is nevertheless altogether likely that he will die from cancer of the liver, with its attendent cachexia, and not from progressive starvation—although, I say, to draw such a picture of the future for his unfortunate patient would be diabolically cold-blooded in the surgeon, yet I doubt not that many a patient, dying of the cancerous cachexia some two years after the operation, will daily bless the art of surgery which has so prolonged his life and mitigated his suffering during the gradual approach of death.

But, though the chances of permanent cure are slight, they are not altogether imaginary. Among more than 100 cases of gastrectomy for carcinoma, Kocher[33] has had permanent cure result in 8 patients, who were reported as living and well at periods varying from three to sixteen years after the operation. Paterson[34] has collected, mainly from British sources, the end results of 79 cases of gastrectomy, 46 patients (58.4 per cent.) dying of recurrence within three years, and 33 patients (41.6 per cent.) being alive and well at the end of three years or more after the operation. No less than 12 patients (15 per cent.) were in perfect health more than five years after the operation, some being in good health at periods varying from six to fourteen years after the operation. We may expect, then, about 10 or 15 per cent. of patients treated by gastrectomy to be permanently cured without liability of recurrence.

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[32] Gastric Surgery, New York, 1906, pp. 106 and 107.

[33] Revue de gyn. et de chir. abd., 1906, x, 103.

PATERSON'S STATISTICS OF END RESULTS OF GASTRECTOMY.

	Recovered	Traced.	Died since operation.	Still living and well. Three years after operation.	Still living and well. Five years after operation.
Total gastrectomy	17	14	5	6	3
Subtotal gastrectomy	14	12	6	3	3
Partial gastrectomy	55	53	35	12	6
	86	79	46	21	12

There is another question of importance in regard to the surgery of gastric carcinoma which cannot be answered offhand. This is as to the advisability of excising ulcers or of doing a pylorectomy or a partial gastrectomy in the presence of benign disease as a preventive of malignant changes. I have argued in favor of gastro-enterostomy as a prophylactic operation; and it may have been cause for surprise that I have not hitherto even mentioned excision of the ulcer or of the diseased gastric area. This ommission, however, has been intentional, since I desire first to contrast the immediate operative mortality of the two forms of surgical treatment. And in doing this I am, of course, not ignorant of the fact that gastrectomy in a cancerous patient is unavoidably a more fatal operation than it is in one suffering only from benign disease. But although I am quite willing to admit this fact, yet the operation of partial gastrectomy presents *per se*, and apart from the vitality of the individual patient, certain added risks, which in the present state of surgery are unavoidable, but which must, I venture to think, be obviated before the conscientious surgeon can recommend this operation in preference to gastroenterostomy in patients with benign gastric disease. The time may come, indeed I hope it is not far distant, when the operative mortality of gastrectomy will be reduced from 25 per cent., its present figure, to less than 10 per cent., but until that day has been reached I for one cannot feel justified in resorting to the more dangerous operation in cases certainly benign. I say this, too, with full knowledge and personal experience of patients who recover as blithely from a gastrectomy as they do from an interval operation for appendicitis. In my own experience with gastrectomy, comparatively small though it be, I have been surprised at the freedom from symptoms and the easy convalescence of some patients on whom quite extensive operations have been done; but, although increasing experience with the operation has made me regard it as neither so difficult nor so serious an undertaking as I formerly thought it, yet I have not yet reached, and I humbly trust never shall reach, that point where familiarity will breed contempt.

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[34] Gastric Surgery, New York, 1906, p. 108.

The arguments advanced in favor of excision of the ulcer or of the ulcer-bearing area, sound as some of them undoubtedly are, do not, in my opinion, outweigh the arguments against this treatment, which I have already stated. Though I firmly believe that the chief predisposing cause of gastric carcinoma is long continued dyspepsia due to ulcer or other form of benign gastric disease, yet I do not altogether credit the reports which would make us believe that about 1 out of every 10 ulcer cases is already cancerous.

Originally advocated by Rydgier,[35] who has recently[36] had the satisfaction of reporting his first patient as alive and well twenty-five years after the operation, pylorectomy was, nevertheless, a method which quickly fell into disrepute, owing to its enormous mortality. But in the last few years excision of the ulcer or of the pyloric region has again become popular with some surgeons (Maydl, Jedlicka, Ali, Krogius, Rodman, and others), chiefly as a prophylactic against the development of carcinoma, though there are also other reasons (absence of subsequent perforation or hemorrhage) which they urge for its more general adoption. Yet it seems to me that a diagnosis of "carcinomatous degeneration," based on microscopic findings, as to whose interpretation pathologists themselves are not unanimous, is at least as liable to be in error as is a clinical diagnosis of malignant disease based on the naked-eye appearance of a pyloric tumor found at operation; and it seems fair to conclude that patients in the former class might be as thoroughly cured by a palliative operation as have been those patients, by no means unknown to science, who presented a gastric tumor which was considered a naked-eye evidence of malignant disease too far advanced to be treated by excision.[37]

It is, therefore, with caution that I accept the conclusions of Jedlicka,[38] who argues very positively in favor of excision of benign ulcers. Following his late master, Maydl, he records, during the period from 1891 to 1904, 34 gastric or pyloric resections for benign disease, with 2 deaths, a mortality of a little less than 6 per cent. It is not his operative results that I mistrust, for they are brilliant and speak for themselves; but it is the conclusions which he deduces from a study of his cases that I think should be accepted with caution. He states that his microscopic studies (confirmed in most cases by Hlava) showed that of his patients whose stomachs were resected for gastric ulcer, supposedly benign, no less than 26 per cent. had commencing malignant degeneration. He points out, moreover, that of the 41 patients whose stomachs were resected, between 1891 and 1901, for carcinoma, not one is alive now; whereas, of the 4 patients whose stomachs were resected in the same time for supposedly benign disease, which was, however, afterward found by the microscope to be malignant, but in an early stage—that of these 4 patients, the first is well eight years after the operation, the second is well four years after the operation, the third is still too recent to count, and only 1 died of recurrence, and then only after two circular resections of the stomach. In all fairness I must add that Mayo Robson[39] has recently reported, among 97 patients operated on by gastroenterostomy for benign disease, no less than 4 who developed cancer at periods of from one to three and one-half years after the palliative operation; and that Czerny's clinic[40] furnished 3 such results among 83 operations for benign disease. But then it must not be forgotten that if these patients had been treated by the more dangerous method of gastrectomy, it might have been their fate to succumb to the operation—a result immeasurably worse than the remote and improbable chance of carcinomatous change several years subsequent to operation. So that while it is right to acknowledge the force of the arguments advanced by the advocates of gastrectomy as a prophylactic measure, I think it is a saner course to limit the more dangerous operation of resection to the more serious condition of acknowledged malignancy, and when there is doubt as to the existence of malignant disease to perform the more extensive operation, not as a routine measure, but only in carefully selected cases.

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[35] Berl. klin. Woch., 1882, xix, 39.

[36] Ibid., 1906, xliii, 1207.

[37] See cases reported by Bidwell, AMER. JOUR. MED. SCI., 1899, ii, 260; Demoulin et Tuffier, Bull. et mem. de la Soc. de chir. de Paris, 1899, xxv, 833; Robson and Moynihan, Diseases of the Stomach, New York, 1904, p: 386; Wallis, Brit. Med. Jour., 1906, ii, 73.

[38] Operativ. Behandl. d. Chron. Magengeschwürs, Prag., 1904.

There remains for discussion the choice of operation on patients who are undeniably affected with carcinoma. Until operation is more frequently undertaken in the very early stages of the malady, gastroenterostomy must still be the operation most often adopted. It has been rare in my experience, as I think also in that of other surgeons, for a patient in whom cancer has been certainly diagnosticated before operation to present conditions admitting of gastrectomy. The operations of gastrectomy that I have done myself have been on patients in whom the existence of malignant disease was merely suspected, but not certainly known, before the abdomen was opened.

[39] First Congress of Internat. Soc. of Surgery.

[40] Petersen u. Machol, Beitr. z. klin. Chir., 1902, xxxiii, 297.

A palpable tumor felt before operation will naturally suggest cancer; but the case reports already referred to, in which such masses have been known to disappear after gastroenterostomy, prove that all palpable tumors are not carcinomatous in nature. I have urged elsewhere[41] that in this class of patients exploratory laparotomy finds its most legitimate field. The statistics from the clinics of Krönlein and Mikulicz, recently compared by Moynihan, show that patients who have undergone an exploratory laparotomy in which no further operative treatment was possible, actually lived longer than did those whose disease was so far advanced as to make even an exploration unjustifiable, or those who entirely refused an operation of any kind. In very many operations, moreover, which are commenced as explorations merely, it is found possible either to remove the growth or, at least, to perform a palliative operation which will materially prolong life and relieve suffering. Surgeons, I fear, sometimes lose sight of the fact that this and not the production of statistics is the end and object of surgery.

We have a choice of radical operations for cancer of the stomach, dependent upon the extent of the disease. Total gastrectomy, though it has been adopted in no less than 27 instances, must remain, I think, an operation of the utmost rarity. Personally I do not approve it. Though 17 patients survived the operation (a mortality of over 37 per cent.), I think it probable that the mortality will rather increase than decrease if the operation be indiscriminately employed. Subtotal gastrectomy, as it is called by the French, is in my opinion as extensive an operation as it is wise to adopt. I have successfully (?) removed as much as two-thirds of the stomach, always leaving the cardiac end and the "greater tuberosity" untouched. The operation of pylorectomy, or partial gastrectomy as it is now more accurately called, is that form of excision which is most generally applicable. The mortality of subtotal gastrectomy was 30 per cent. in 20 cases collected by Paterson—all he could find records of; while the average mortality of partial gastrectomy for carcinoma is, as we have already seen, from 26 to 28 per cent.

Adhesions, I think, a more formidable objection to radical removal than size of the tumor or lymphatic involvement. Especially is this true when the adhesions involve the pancreas. Enlarged glands should always be removed when possible, but as they are frequently the seat merely of inflammatory, not of malignant changes, their number need not discourage the surgeon from attempting radical cure by gastrectomy, provided the tumor is fairly movable. Thus Taylor[42] did a partial gastrectomy in a woman, aged sixty years, excising with the tumor *en masse* some of the right rectus abdominis muscle to which it was adherent, along with some enlarged glands in the gastrohepatic omentum. The patient recovered, and microscopic study of the tumor showed that it was of purely inflammatory character. Still more extensive operations have been performed when the growth was really carcinomatous. Moynihan[43] has twice (once with success) excised a tumor of the stomach with the corresponding portion of the transverse colon which was implicated in the malignant growth; and a similar operation has been successfully performed by Childe[44] (for unavoidable destruction of the blood supply, not for carcinomatous invasion), who also excised a layer of pancreatic tissue.

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[41] N. Y. State Jour. of Med., 1906, vi, 64.

[42] Indian Lancet, 1906, i, 668.

For the restoration of the gastrointestinal canal after gastrectomy I much prefer the usual posterior retrocolic gastroenterostomy to either of Billroth's methods, or to Kocher's operation of lateral implantation of the duodenum into the posterior gastric wall. In some patients, I think, it is wise to do this part of the operation first. Paterson also has recommended this course, and suggests that while the gastroenterostomy is being done, a piece of the suspected growth can be frozen and examined under the microscope. The plan suggested a decade or more ago by Tupolske, of doing a gastroenterostomy at one sitting and postponing the gastrectomy for several weeks, is open to the objection, as Mayo Robson[45] has pointed out, that the patient may be so much relieved by the palliative operation that he will decline further treatment. In one of Paterson's patients, however, treated thus by a preliminary gastroenterostomy, good health persisted after four years; so it is probable that in this individual case it was wise for the patient to decline excision of the supposedly malignant growth.

When the carcinoma has progressed very far, so that not even gastrojejunostomy can be done, the operation of jejunostomy will relieve suffering and may prolong life. I do not think the profession in this country appreciate the degree of alleviation of suffering which this procedure affords. The fistula should be established by a technique similar to that employed by Witzel in performing gastrostomy. In such patients, after opening the abdomen, no time should be lost in idly exploring the stomach and duodenum. We should know before commencing the operation what it is desired to accomplish, and the primary loop of the jejunum should be immediately sought and attached in the manner advised to the anterior abdominal wall. I prefer the incision splitting the fibers of the left rectus muscle. Feeding should be begun almost immediately, in moderate amounts, such as would be given to a starving man under other circumstances. Rectal alimentation may also be employed, but, except for the saline solution which can be thus absorbed, it is of little value.

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[43] Trans. Chir. Soc. London, 1906, xxxix, 84.

[44] Brit. Med. Jour., 1906, i, 194

[45] Ibid., 1900, i, 696.

In conclusion, I may say:

1. By timely operation for the various causes of persistent indigestion, many patients will be saved from developing gastric carcinoma.
2. Early diagnosis of gastric carcinoma being so extremely difficult, and radical removal being only highly promising when an early diagnosis has been made, partial gastrectomy should be an operation limited to cases of malignant disease operated on for symptoms of pyloric obstruction or other gastric affection supposedly benign, in which the existence of cancer, though perhaps suspected, cannot be certainly diagnosticated before operation.
3. In cases of gastric carcinoma moderately advanced gastroenterostomy should be preferred to partial gastrectomy.
4. When the indication is to prevent starvation, jejunostomy should be performed.

HYDROCEPHALUS COMPLICATING EPIDEMIC CEREBROSPINAL MENINGITIS.

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Hydrocephalus complicating or occurring with acute cerebrospinal fever is of the greatest practical and clinical importance. It has been observed since the disease has been recognized. In modern times a description of it begins with Foerster, in 1883, but a more extended consideration is given it by von Ziemssen and Hesse. These authors, in describing an epidemic of cerebrospinal meningitis, with autopsies, record cases of associated hydrocephalus in which the duration of the disease was comparatively short, from eight to nine days, and in which autopsy showed a dilatation of the ventricles with purulent content. Other cases with autopsies are recorded by these authors, in which the disease had a protracted course, from seventeen days in one case, to ten weeks in another, and in which autopsy revealed dilated ventricles of the brain filled with purulent content. Cases were observed in young children as well as in adults. A classical, clinical analysis of their cases showed that the hydrocephalus was accompanied by headache, vomiting, unconsciousness, and convulsions, and that this symptom-complex in some cases remitted, to return at irregular intervals.

Von Ziemssen[1] lays particular stress on the paroxysmal nature of the symptoms which accompany hydrocephalus complicating

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[1] Handbook of Infectious Diseases, vol. ii.